

**NoPig Metal-Loss Detection System
For
Non-Piggable Pipelines
FINO AG
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The NoPig system upgrade was finished resulting essentially in a reduction of systematic errors. The actual status of the system allows recognition of small magnetic field displacements which are many times weaker than at the beginning of this project. On this way the sensitivity of the system for detection of small defects is essentially enhanced.

The modeling was continued and extended by the addition of a simplified 3D model to calculate displacements for defects with a finite length. This model was used to calculate transition curves over a girth weld. Tests of this model have shown that for some simple situations (like an isolated defect in a seamless pipe or a girth weld between two long seam joints) the modeling results are acceptable. Otherwise, for tasks coupled with real situations like long seam pipeline with defects and girth welds a real 3D software is necessary for modeling. Now such a software will be tested at our company. This software was especially adapted for such tasks like pipelines calculations.

Different pipes with long seams were prepared and studied, including investigations of material properties and different defects. Investigations of defects in ERW – long seam pipes undertaken have shown that, not in every case, a defect feature in the magnetic field displacements can be recognized from the background displacements evolved by long seams. Especially this holds true for the NoPig reference defect. A possible reason for missing defects in long seam pipes is a more complicated character of the background displacements evolved by the long seam and the pipe itself. This results in a non-constant displacement offset which, in some cases, masks defect features.

Analytical and experimental studies performed in this quarter show a possible way to solve this problem and to enhance the sensitivity of the NoPig system. The recognition of defect features in the background of field deformations caused by intrinsic features of pipes like long seam can be improved if analyzing different character of magnetic field deformations evoked by long seams and defects.

Point of Contact:

Matthias Heldt

FINO AG

Am Flugplatz 13

31137 Hildesheim

Germany

m.heldt@finoag.com

Tel.: +49-5121-28126-0

Fax.: +49-5121-28126-66